

What is claimed is:

1. A hole plugging method for plugging via holes in printed circuit boards, wherein a via hole which is formed to electrically connect a circuit pattern formed on an exterior of a printed circuit board and a circuit pattern formed inside the board is plugged with an insulating material by abutting a squeegee for plugging the insulating material in the via hole directly against a surface of the printed circuit board at the location of the via hole.

2. The method of claim 1, wherein the insulating material is plugged only in the exposed via holes using a mask for exposing the via holes selectively.

3. The method of claim 1, wherein the board further has at least one through hole formed therein for electrically connecting circuit patterns formed at the upper and lower side surfaces and the insulating material is plugged only in the exposed via holes by positioning the mask for selectively exposing only the via holes on the board.

4. The method of claim 1, wherein the board further has at least one through hole formed therein for electrically connecting circuit patterns formed at the upper and lower side surfaces and the insulating material is plugged in the exposed through hole by positioning the mask for selectively exposing the through holes on the board.

5. The method of claim 4, wherein the insulating material is plugged in the

through hole using a squeegee directly abutted to the board through the mask.

6. The method of claim 1, wherein the insulating material is a solder resist.

5 7. The method of claim 1, wherein the insulating material is among an epoxy resin.

10 8. The method of claim 1, wherein the insulating material is plugged only in the exposed via holes using a mask for exposing the via holes selectively, and a blade of the squeegee is pressed through the openings in the mask and abutted on the surface of the board.

15 9. The method of claim 1, wherein the insulating material is plugged only in the exposed via holes using a mask for exposing the via holes selectively, and a blade of the squeegee is abutted to the board through openings in the mask and flexed so as to impart forward and downward force to the material being plugged in the board.

20 10. A hole plugging method for printed circuit boards where the via hole is formed to electrically connect a circuit pattern formed on the surface of the board and a circuit pattern formed in the board, wherein an insulating material is plugged in exposed via holes by positioning a mask for selectively exposing the through holes on the board.

25 11. The method of claim 10, wherein the insulating material is plugged

in the via holes by abutting a squeegee to the board through the selectively exposed areas for plugging the insulating material in the via hole.

12. The method of claim 10, wherein the board further has at least one  
5 through hole for electrically connecting circuit patterns formed at the upper and lower side surfaces and the insulating material is plugged only in the exposed via holes by positioning the mask for selectively exposing only the via holes on the board.

10 13. The method of claim 10, wherein the board further has at least one through hole for electrically connecting circuit patterns formed at the upper and lower side surfaces and the insulating material is plugged in the exposed through holes by positioning the mask for selectively exposing the via holes on the board.

15 14. The method of claim 13, wherein the insulating material is plugged in the through hole using a squeegee directly abutted to the board.

15. The method of claim 10, wherein the insulating material is solder resist.

20 16. The method of claim 10, wherein the insulating material is among an epoxy resin, conductive paste and solder paste.

25 17. A hole plugging method for plugging via holes in printed circuit boards having via holes for connecting a circuit pattern to electrically connect a circuit pattern formed on the surface of the board and a circuit pattern formed in the

board comprising:

preparing a mask exposing a via hole and covering other areas on the board not having via holes thereon positioning the mask on the board; and  
plugging an insulating material in the via holes by coating the insulating material on the areas of the board exposed by the mask.

18. The method of claim 17, wherein the insulating material is plugged by being coated by directly abutting a squeegee on the surface of the board through the mask in the above step of plugging the insulating material in the via holes.

19. The method of claim 17, further comprising a step of coating the insulating material on the whole board with a certain thickness after removing the mask in the above step of plugging the insulating material in the via holes.

20. The method of claim 17, wherein the insulating material is a solder resist.

21. The method of claim 17, wherein the insulating material is among an epoxy resin.

22. A hole plugging method for printed circuit board having a via hole for electrically connecting a circuit pattern formed on the surface of the board and a circuit pattern formed in the board and a through hole for electrically connecting the circuit patterns of the both side surfaces, comprising the steps of:

providing a mask for exposing a via hole on the board and covering other

area on the board having a via hole positioning the mask on the board; and  
plugging an insulating material in the via hole by coating the insulating material on the area of the board exposed by the mask.

5 23. The method of claim 22, wherein the insulating material is plugged into the via holes when the insulating material is coated on the board by directly abutting a squeegee on the surface of the board in the above step of plugging the insulating material in the via hole.

10 24. A hole plugging device for plugging a via hole on a printed circuit board, comprising  
a mask positionable on a surface of a printed circuit board and having an opening exposing an area of the surface where a via hole is formed electrically connecting a circuit pattern formed on the surface of the board and a circuit  
15 pattern formed in the board ; and  
a pressing means for pressing an insulating material into the via hole by coating the insulating material on the surface of the board exposed by the mask.

20 25. The device of claim 24, wherein the mask is made of a metal material.

26. The device of claim 24, wherein the pressing means is a squeegee for pushing and pressing the insulating material by directly being abutted on the surface of the board through the opening in the mask.

25 27. A hole plugging device for plugging holes in a printed circuit board,

comprising

a mask positionable on a surface of a printed circuit board and having an opening for exposing said surface where a via hole electrically connecting a circuit pattern formed on the surface of the board and a circuit pattern formed in the board and a through hole for electrically connecting the circuit patterns of the both side surfaces are formed; and

a pressing means for pressing an insulating material into the via hole by coating the insulating material onto the surface of the board exposed by the mask.

28. A hole plugging method for plugging holes in a printed circuit board, wherein a solder resist or insulating resin is filled in spaces between surface side circuit patterns by moving a squeegee under the condition of being abutted on an upper surface of a circuit pattern formed on the surface of a printed circuit board and formed in the board and a hole for electrically connecting the circuit pattern formed on the surface of the board and the circuit pattern formed in the board or for connecting the circuit patterns on the both side surfaces and by moving the squeegee while being abutted to the surface of the printed circuit board.

29. The method of claim 28, wherein the solder resist or insulating resin is plugged into the hole by moving the squeegee under the condition of being abutted directly on the upper surface of the hole.

30. The method of claim 28, comprising:

a first step of plugging the solder resist or insulating resin in one portion of the hole by moving the squeegee under the condition of being abutted on the

upper surface of the hole; and

a second step of completely plugging the solder resist or insulating resin in the whole portion of the hole by moving the squeegee under the condition of being abutted on the upper surface of the hole.

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31. The method of claim 30, wherein in the second plugging step the solder resist or insulating resin is plugged in the hole by moving the squeegee in the opposite direction to the moving direction of the squeegee in the first plugging step.

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32. The method of claim 30, wherein in the second plugging step the solder resist or insulating resin is plugged in the hole by moving the squeegee in the same direction to the moving direction of the squeegee in the first plugging step.

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33. The method of claim 28, wherein the solder resist or insulating resin is coated only on an area exposed by a mask for selectively exposing the plurality of circuit patterns formed on the printed circuit board at a predetermined interval or on the hole.

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34. The method of claim 28, wherein the solder resist or insulating resin filled in the spaces among the surface side circuit patterns is filled to the same height as the upper surface of the circuit patterns.

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